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सामान्य सेवा लैम्पों के लिए तन्तु — मार्गदर्शिका

(पहला पुनरीक्षण)

Indian Standard

FILAMENTS FOR GENERAL SERVICE LAMPS — GUIDE

(First Revision)

ICS 29 140 20

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

March 2001

Price Group 2

Electric Lamps and their Auxiliaries Sectional Committee, ET 23

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Electric Lamps and their Auxiliaries Sectional Committee had been approved by the Electrotechnical Division Council

This standard was first published in 1990 and was primarily intended to provide guidance for the testing of tungsten filament for coiled coil type used in general service electric lamps for domestic and similar purposes. This revision has been brought out to take into account the experience gained through the implementation of this standard since it was published

The important features of this revision are

a) Limits of overall length,
b) Introduction of cold resistance value,
c) Storing conditions,
d) Weight of filament,
e) Supply conditions, and
f) Title of the standard has been compressed

It is hoped that the standard will help the filament manufacturers and the lamp manufacturers in having better understanding about their specific requirements at the time of supply and procurement

AMENDMENT NO. 1 DECEMBER 2006
TO
IS 12897 : 2001 FILAMENTS FOR GENERAL SERVICE LAMPS — GUIDE

(First Revision)

(*Page* 3, *clause* **A-2**, *line* 4) — Substitute the word 'quality' *for* 'quantity'

(*Page* 4, *Table*, *row* 1 to 3, *column* 2, *Inspection Level*) — Substitute III *for* 'IV'

(ET 23)

Reprography Unit, BIS, New Delhi, India

Indian Standard

FILAMENTS FOR GENERAL SERVICE LAMPS — GUIDE

(First Revision)

1 SCOPE

This standard provides guidance for testing, selection and supply conditions of tungsten filaments for coiled coil type for use in general service electric lamps upto and including 100 W, rated voltage not exceeding 250 V

2 REFERENCES

The following Indian Standards are necessary adjuncts to this standard

IS No	*Title*
418 1978	Tungsten filament general service electric lamps (*third revision*)
2500 (Part 1) 1992	Sampling inspection procedures Part 1 Attributes sampling plans indexed by acceptable quality level (AQL) for lot-by-lot inspection (*second revision*)
11900 1986	Tungsten rods and tungsten wires for lamps and electron devices

3 TERMINOLOGY

3.0 For the purpose of this standard, following definitions shall apply

3.1 Overall Length — straight length from end to end of the filament

3.2 Leg Length — projected portion of the filament in single coil form as measured from nearest end to the point where the secondary coil starts

4 MATERIAL

The filament shall be drawn out of tungsten wires conforming to IS 11900

5 PACKING

The filament shall be packed in suitable containers lotwise to avoid damage during transit and storage The packing of the filament shall be such that the coils are not entangled and are easily separable Each container shall be provided with the indication of the source of manufacturer, wattage type of filaments, quantity, overall length, date of manufacture and lot number

6 STORING CONDITIONS

The filaments shall be stored in a dust free atmosphere having relative humidity of 65 ± 5 percent and ambient temperature 27 ± 5°C

7 TESTS

7.1 Type Tests

The following shall constitute the type tests

a) Visual examination (*see* 7.2),
b) Overall length (*see* 7.3),
c) Leg length (*see* 7.4),
d) Brittleness test (*see* 7.5),
e) Uniformity of coiling (*see* 7.6),
f) Pitch touching (*see* 7.7),
g) Wattage and lumen (*see* 7.8),
h) Flash off tendency (*see* 7.9),
j) Life test (*see* 7.10),
k) Cold resistance (*see* 7.11), and
m) Weight of filament (*see* 7.12)

NOTE — The test for wattage, lumen and life shall be as mutually agreed between the supplier and the purchaser

7.2 Acceptance Tests

The following shall constitute the acceptance tests

a) Visual examination (*see* 7.2),
b) Overall length (*see* 7.3),
c) Leg length (*see* 7.4),
d) Brittleness test (*see* 7.5),
e) Uniformity of coiling (*see* 7.6),
f) Pitch touching (*see* 7.7),
g) Wattage and lumen (*see* 7.8),
h) Cold resistance (*see* 7.11), and
j) Weight of filament (*see* 7.12)

NOTE — The test for wattage and lumen shall be as mutually agreed between the supplier and the purchaser

7.2.1 The sampling procedure and criteria of acceptance shall be subject to agreement between the supplier and the purchaser In the absence of such an agreement, the sampling procedure detailed in Annex A may be followed

7.3 Routine Test

The following shall constitute the routine test

Visual examination (*see* 7.4)

7.4 Visual Examination

The filaments are taken and arranged on a glass plate so that the filaments get close to each other and the ends of the filaments are uniaxial The filaments are checked visually under bal optical instrument or profile projector for any uneven primary pitches and other visual defects, such as turns touching each another, uniformity of coiling, mandrel remainder, burrs, etc

The filaments shall also be observed for any black spot or spots over the surface

7.5 Overall Length

The declared overall length of the filament shall be in the range of 33 to 36 mm for 60W and 100W and 27 to 30 mm for 15W to 40W The variation in overall length from the declared value shall not be more than ±0 5 mm.

7.6 Leg Length

The filament shall be checked on both sides for leg length The declared value of leg length shall be within the range of 2 0 mm to 3 0 mm The tolerance on the declared value shall be ± 0 5 mm

7.7 Brittleness Test

The brittleness of the filament shall be checked as per the following procedures.

a) *At Legs*

   The filaments shall be pressed against glass plate with a rounded edge nickle strip having a width of 0 9 mm ± 0.1 mm,

b) *Coil Body*

   The filament shall be stretched smoothly and unformly by hand to 4 times the body length by holding at both legs on both directions The rate of stretching shall not be greater than 3 mm/s

In both the above cases, the filament shall not break

7.8 Uniformity of Coiling

The filament shall be checked with the help of standard microscope or profile projector and pitch variation as observed shall be as given below

a) Last 2 turns of each end shall be within + 50 percent – 20 percent of pitch,
b) Other secondary turns shall be within + 30 percent and – 20 percent of pitch; and
c) Percentage of primary turns touching shall not exceed 1 percent

7.9 Pitch Touching

The filament shall be checked with the help of bal optical instrument or profile projector No secondary turns shall touch each other

7.9.1 In the case of primary turns, not more than two turns shall touch each other at maximum of two places.

7.10 Wattage and Lumens

7.10.1 *Wattage*

It shall be as per IS 418

7.10.2 *Lumens*

It shall be as per IS 418

7.11 Flash off Tendency

Filaments shall be checked for arcing/flash off tendency of a sample trial out of the lot by actual running of the manufacturing chain and the defect shall not be more than 0 4 AQL

7.12 Life Test

Lamps made out of filaments selected at random shall be put for life test and the individual as well as average life should be as per IS 418

7.13 Cold Resistance

The filaments shall be checked for cold resistance using a suitable measuring equipment capable of measuring to the fourth decimal place of the resistance in ohms by allowing a current of not more than lmA The measurement shall be made at a temperature of 27 ± 2°C and relative humidity not exceeding 70 percent. The measured cold resistance shall be as declared by the manufacturer and its value shall be with ± 5 percent of the declared value

7.14 Weight of Filament

The weight of the filament measured shall be within ± 5 percent of the value declared by the manufacturer The sample size for the test shall be ten pieces of filament of same rating.

7.15 Supply Conditions

7.15.1 The purchaser of tungsten filaments shall specify the following parameters to the supplier while placing the order:

a) Type of filament that is, single coil (SC) or coiled coil (CC),
b) Rated wattage,
c) Rated voltage,
d) Rated life,

e) Over all length, and

f) Leg length

7.15.2 The supplier shall provide the following information contained in a test certificate alongwith the batch of the tungsten filament

- a) Type of filament - Single Coil (SC) or Coiled Coil (CC)
- b) Rated wattage - and lumens — Supplier can also give the *Min* and *Max* wattage and lumens for the batch, if he has got lamp making and testing facilities
- c) Rated voltage
- d) Over all length
- e) Leg length
- f) Cold resistance with the *Min* and *Max* values of the batch
- g) Piece weight with the *Min*, and *Max* values of the batch

NOTES

1 Individual test certificate can be replaced by a long term contract between the purchaser and the supplier, if so mutually agreed between the two.

2 The filament supplied shall not be sticky or entangled to the extent which cannot be separated easily.

ANNEX A

(*Clause* 7.2.1)

SAMPLING FOR ACCEPTANCE TESTS

A-1 In a consignment, all the filaments of same size and rating manufactured from the same material under similar conditions of production shall be grouped together to constitute a lot.

A-2 Unless otherwise agreed to between the supplier and the purchaser, the procedure given in IS 2500 (Part 1) shall be followed for sampling inspection. The inspection level, acceptable quantity level (AQL) and type of sampling plan to be followed for various characteristics shall be as follows.

A-3 For weight of filament and cold resistance the sample size of 10 pieces shall be taken and no defectives are allowed.

Test	*Inspection Level*	*Type of Sampling Plan*	*Acceptance Quality Level (AQL), Percent*
Visual examination	IV	Double	1.5
Overall length	IV	- do -	1.0
Leg length	IV	-do-	1.0
Uniformity of coiling	III	-do-	1.0
Pitch touching	III	-do-	1.0
Brittleness test	II	-do-	1.0

NOTE — For wattage and lumen the sampling and acceptance criteria shall be those given in IS 418.

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